Author’s response to reviews

Title: Intra-abdominal hypertension due to heparin-induced retroperitoneal hematoma in patients with ventricle assist devices: report of four cases and review of the literature

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Dear Assistant Editor

After taking into consideration the comments of the referees we submit our revised manuscript providing at the same time a point to point response to the concerns of the referees.

Reviewer: George Chatzoulis

1. The large retroperitoneal hematoma has led to an ACS in our cases. The hematoma was so tense in all cases that it would erupt anteriorly once the abdominal pressure was released. According to the literature in selective cases, image-guided drainage of haematoma may be an alternative to open surgery to release intra-abdominal pressure and to minimize the phenomenon of inta-abdominal hypertension. Isokangas JM, Perala JM. Endovascular embolization of spontaneous retroperitoneal hemorrhage secondary to anticoagulant treatment. Cardiovasc Intervent Radiol 2004; 27: 607-11. On the same basis we preferred to evacuate the hematoma and minimize the phenomenon of inta-abdominal hypertension because the main and life threatening signs of an ACS were our main concern. Yes indeed, by removing
the effect of tamponade the hemorrhage may become worse and certainly this was the reason because in one of our cases we had to pack and re-explore. In the other patients we didn’t face the same problem.

2. All the patients in our center before operation and in order to receive a LAD or a Bi-VAD they are tested for HIT (ELISA & HIPAA). In all cases the HIT test was negative. After the implantation of the assist device the number of platelets was reduced but the post-operation labor test didn’t prove any HIT.

3. Changes to the second paragraph were made.

Reviewer: Aristidis Dongas Dr. med

1. Background was re-evaluated

2. Although a METHODS section would summarize our finds and it may have given a better view of how we reached our goal such section conforms not to the journal style. Taking into consideration the reviewers comments we did changes to point out this chain (Indicators-Measurements-managements).

3. Measuring the IAP is essential, as the clinical examination cannot reliably identify patients with elevated IAP. Several methods of measuring IAP have been described; Kron et al. used intravesical pressure to represent IAP, measuring the intravesical pressure with a manometer attached to a Foley catheter placed in the bladder. Cheatham et al. revised that technique and described a closed-system device that enabled repeated measurements of the intravesical pressure and thereby, close, convenient and safe monitoring of the IAP. Kirkpatrick et al. conducted a prospective blinded study and found that the sensitivity of the clinical examination was only 40% for an IAP of >10 mmHg, and 56% for >15 mmHg.

The measure of IAP was made with the patient supine and with the following method, the same in all cases. We used the measurement of IAP to justify our therapy and to examine – prove that the signs were relevant to this clinical entity.

Method: Injection of 50-100 ml of sterile saline into the Foley catheter via the aspiration port; cross-clamp the sterile tubing of the urinary drainage bag just distal to the culture aspiration port; the end of the drainage bag tubing is connected to the indwelling Foley catheter; the clamp was released just enough to allow the tubing proximal to the clamp to fill with fluid from the bladder and then the clamp was reapplied; Y-connect a pressure transducer to the drainage bag, via the culture aspiration port of the tubing, using a 16-gauge needle; the IAP was determined from the transducer using the top of the symphysis pubis bone as the zero point with the patient supine.

4. We have tried in our report to highlight the most precious facts, signs and symptoms from every case that we describe and not to present in all cases the same facts that led us in the diagnosis. According to this fact we preferred to skip facts, methods, symptoms and measures in cases 3 & 4 that were already mentioned in cases 1 & 2.
5. Changes to make clear that the Intra cystic pressure was not sporadic but continuous were made.

6. Data for case 1 was added

We consider the help of the reviewers very important in order to bring forward our modified manuscript.

We would like to thank them as well as you in advance for the opportunity we were given to re-evaluate our work and we are looking forward hearing from you.

Yours sincerely

Stavros I. Daliakopoulos